NEW CREODONTA FROM THE SESPE UPPER EOCENE, CALIFORNIA

BY CHESTER STOCK

BALCH GRADUATE SCHOOL OF THE GEOLOGICAL SCIENCES, CALIFORNIA INSTITUTE OF TECHNOLOGY

Communicated May 28, 1934

Introduction.—In contrast to the Hyænodontidæ and the cercoleptoid miacid occurring in the uppermost Eocene fauna of the Sespe deposits north of the Simi Valley, the Creodonta now known from the upper Eocene stage of this region include two representatives of the Miacidæ. One of these, herein described as a new genus, is important because of its close relationship to a form recorded by Peterson[1] from the Uinta upper Eocene of Utah.

Tapocyon occidentalis, n. gen. and n. sp.

Type Specimen.—$P\underline{4}$ and $M\underline{1}$ of right side, representing one individual, No. 1654 Calif. Inst. Tech. Vert. Pale., plate 1, figure 1.

Paratype.—A fragmentary left ramus with canine, $P\bar{2}$, $P\bar{3}$, $M\bar{1}$ and $M\bar{2}$, No. 1655, plate 1, figure 3.

Referred Specimens.—Several fragments of rami with teeth, Nos. 1650 (plate 1, figure 5), 1652, 1653, $M\underline{1}$, No. 1651 and $M\bar{1}$, No. 1649 (plate 1, figures 2 and 4, 4*a*).

Locality.—Tapo Ranch, Sespe Upper Eocene deposits north of the Simi Valley, California, Locality 180 Calif. Inst. Tech. Vert. Pale.

Characters.—$M\underline{1}$ more like that in *Procynodictis* than like that of *Uintacyon* in outward projection of parastyle, but differing from former and agreeing with latter in absence of hypocone. $M\underline{1}$ more compressed anteroposteriorly than in *Uintacyon*, *Procynodictis* or in *Miacis*. $P\underline{4}$ differs from *Uintacyon* and is more like that in *Procynodictis* in absence of well-developed parastyle. $M\bar{1}$ with the trigonid shear directed more forward than in *Uintacyon*. Talonid relatively more reduced than in *Procynodictis* and in *Miacis*, with principal cusp crest-like and situated nearer middle anteroposterior line of heel. Posterior lower molars small. Resembles *Prodaphænus* (?) *robustus* in known features of jaw and lower dentition, differing principally from this type in presence of ledge on inner side of posterior region of $P\bar{4}$.

Comparisons.—*Tapocyon* in contrast to *Uintacyon* shows a slightly greater anteroposterior narrowing of the first upper molar and a distinctly greater projection of the anteroexternal corner of the tooth, representing an extension of the parastyle. The paracone is a larger cusp than the metacone. An anterior cingulum swings along the base of the parastyle and ends in a tiny eminence on the occlusal surface to form the proto-

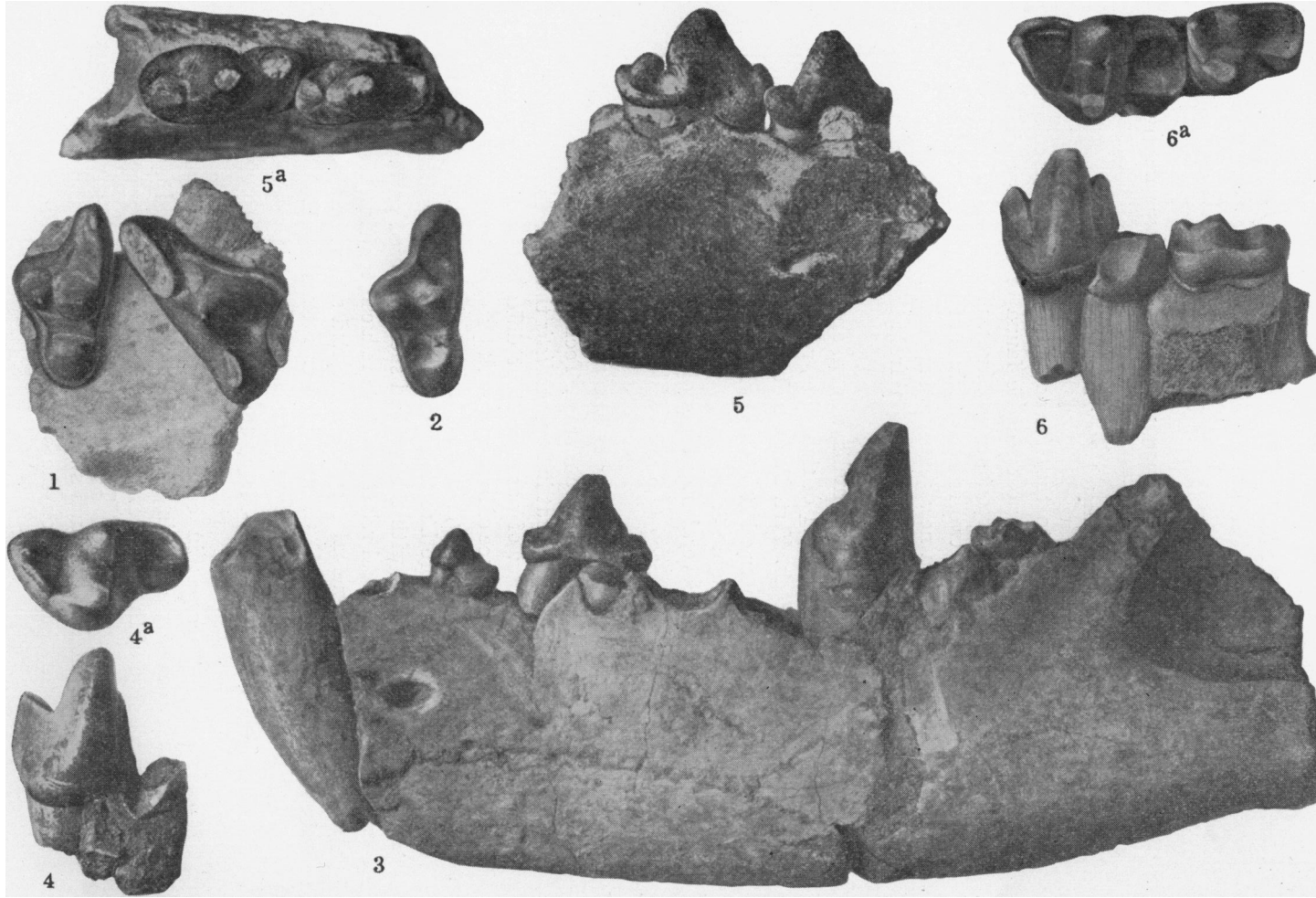

PLATE 1. (Description on opposite page.)

conule. The posterior cingulum, which at the inner base of the metacone expands slightly to form an incipient metaconule, is continued forward around the inner base of the protocone and ends on the anterior side at the base of the protoconule. No hypocone is present as in *Procynodictis*.

In $P\underline{4}$ the protocone projects less toward the inner side and more anteriorly than in *Uintacyon*, so that the cusp is almost in line with the shearing blade. In this respect the tooth is more like that in *Procynodictis* and in *Miacis* than like that in *Uintacyon*. A well-developed parastyle appears to have been absent. Unfortunately, the anterior end of the base of the paracone is broken in specimen No. 1654, but the position of the root which surmounts this region suggests an absence or at least rudimentary development of a parastyle.

The lower dentition is best represented in the paratype, No. 1655, but additional characters are seen in the referred specimens. In so far as comparisons can be made, our form resembles closely the species of *Prodaphœnus* (?) *robustus* from the Uinta. The crown of the canine may have been relatively small and is oval in cross-section. The two anterior premolars are considerably more reduced in size than $P\overline{3}$ and $P\overline{4}$. $P\overline{1}$ is single-rooted. $P\overline{2}$ is two-rooted with a size of crown decidedly smaller than that of $P\overline{3}$. The latter tooth is smaller than $P\overline{4}$, but the difference in size between these two teeth is not so great as the difference between $P\overline{3}$ and $P\overline{2}$. These characters have been pointed out likewise by Peterson for *P.* (?) *robustus*. $P\overline{3}$ possesses a small anterior basal cusp and a larger posterior basal cusp and posterior cingulum. $P\overline{4}$, as shown particularly in one of the referred specimens, No. 1650, possesses an anterior and a posterior basal cusp, the former turned inward somewhat while the latter is flanked internally by a cingulum which continues around to the posterior base of this cusp. Peterson describes this tooth in the Uinta species as having a large cutting heel and his illustration shows the region in back of the principal cusp in $P\overline{4}$ to be compressed transversely, more so than is the case in our specimen. In one of the referred specimens, No. 1652, from the Simi, $P\overline{4}$ although incomplete was apparently nearly as long as the first molar. In the type of *Miacis uintensis*, Osborn[2] observes the presence of two cuspules behind the principal cusp.

DESCRIPTION OF PLATE 1

Tapocyon occidentalis, n. gen. and n. sp.

Figure 1, type specimen, $P\underline{4}$ and $M\underline{1}$, No. 1654; figure 2, $M\underline{1}$, No. 1651; figure 3, paratype, No. 1655; ramus with canine, $P\overline{2}$, $P\overline{3}$, $M\overline{1}$ and $M\overline{2}$; figures 4, 4*a*, $M\overline{1}$, No. 1649; figures 5, 5*a*, ramal fragment with $P\overline{3}$ and $P\overline{4}$, No. 1650. All figures ×2.

Miacis(?) *hookwayi*, n. sp.

Figures 6, 6*a*, type specimen, $M\overline{1}$ and $M\overline{2}$, No. 1656; approximately ×4.

California Institute of Technology Collections. Sespe Upper Eocene, California.

$M\bar{1}$ resembles closely the comparable tooth in *Prodaphœnus* (?) *robustus*. While the three cusps comprising the trigonid are strongly developed, the talonid is relatively small and narrow. The length of the heel may be slightly greater than in Peterson's type. In the Simi species the heel is characterized by a crested hypocone, the tip of which is situated well in from the lateral border, and an inner rim with intervening valley. The type of talonid found in the Simi form is suggestive of that seen in *Uintacyon*, and is at least noticeably different from the broadly basined heel found in *Miacis*.

$M\bar{2}$ is greatly reduced in size with low trigonid and basined talonid. The characters displayed by this tooth are again very similar to those noted by Peterson for the comparable tooth in *P.* (?) *robustus*. $M\bar{3}$ was apparently of small size and single-rooted.

The lower jaw is heavy and the horizontal ramus does not lessen in depth anteriorly. A mental foramen is situated below the anterior border of $P\bar{2}$ with a second small opening below $P\bar{3}$.

Relationships.—Tapocyon is a member of the Miacidæ, displaying certain characters, as for example, the anteroposterior compression of $M\underline{1}$ and the more forwardly directed shearing blade in $M\bar{1}$, in which it marks in advance beyond the stage represented by the Bridger genus *Uintacyon*. Although *Tapocyon* resembles *Procynodictis* in the extended parastyle of $M\underline{1}$, this tooth in the former genus lacks the hypocone. If *Procynodictis* is intermediate between *Miacis* and *Cynodictis*, as Matthew regards it to be on the basis of known characters, the genus from the Sespe cannot be considered as closely related to the former type.

Tapocyon appears to be most closely related to and probably congeneric with *Prodaphœnus* (?) *robustus* from the Uinta. In fact, on the basis of comparable characters, the two forms appear to be closely related specifically. Unfortunately, the name *Prodaphœnus* was proposed by Matthew,[3] in a list of the fauna from the Uinta, for the type *Miacis uintensis*. In the list, however, this designation was preceded by the name *Prodaphœnus scotti*, and the latter type was described under that name as a new genus and species in a later paper.[4] Subsequently,[5] *Prodaphœnus uintensis* was recognized as a subgenus under *Miacis*.

The characters of *Tapocyon* are widely removed from those of *P.* (?) (*Uintacyon*) *scotti* and likewise serve to distinguish the Sespe genus from typical members of *Miacis* in the Bridger Eocene. The relationship of the Sespe genus to *Miacis uintensis* is not entirely clear. Matthew has stated that *M. uintensis* appears to be an aberrant form. The characters displayed by our material also suggest that *Tapocyon* was an aberrant type. Possibly *M. uintensis* belongs to the group represented by *Tapocyon occidentalis* and *T. robustus*.

MEASUREMENTS (IN MILLIMETERS) OF *Tapocyon occidentalis*

	TYPE NO. 1654 C.I.T.	PARATYPE NO. 1655 C.I.T.	REFERRED SPECIMEN NO. 1650 C.I.T.
$P\underline{4}$, length from anterior end of protocone to posterior end of metacone	16		
$M\underline{1}$, greatest width from outer end of parastyle to inner side of protocone	14		
$M\underline{1}$, anteroposterior diameter across paracone and metacone	6.9		
Length from anterior end of C to posterior end of alveolus for $M\overline{3}$ (approx.)		63	
Length of premolar series (approx.)		34	
Length of molar series (approx.)		21	
$P\overline{3}$, length			9.4
$P\overline{3}$, width			4.7
$P\overline{4}$, length			12
$P\overline{4}$, width			5.6

Miacis (?) hookwayi, n. sp.

Type Specimen.—No. 1656 Calif. Inst. Tech. Vert. Pale., a lower jaw fragment with $M\overline{1}$ and $M\overline{2}$, plate 1, figures 6, 6*a*.

Locality.—Tapo Ranch, Locality 180 C.I.T. Vert. Pale.

Description.—In absence of the upper dentition, this form is referred tentatively to the genus *Miacis*. The species is characterized by the broad basins developed on the talonids of the two molar teeth. No. 1656 resembles closely in size the Bridger species *Miacis parvivorus*, but differs from the type specimen of the latter in the presence of a longer heel and more angulate posterointernal corner in $M\overline{2}$. The external cingulum is also more strongly developed in the second molar of the Simi form than in *M. parvivorus* and the tip of the metaconid does not project inward as much as in the latter species.

A well-developed cingulum is present at the base of the shearing blade of the trigonid in $M\overline{1}$. The broad basin of the talonid in $M\overline{1}$ and $M\overline{2}$ is flanked by an external and internal crest.

MEASUREMENTS (IN MILLIMETERS)

	NO. 1656 C.I.T.
$M\overline{1}$, anteroposterior diameter (approx.)	6.5
$M\overline{1}$, transverse diameter of trigonid	4
$M\overline{2}$, anteroposterior diameter	4.4
$M\overline{2}$, greatest transverse diameter	3.2

[1] Peterson, O. A., *Ann. Carnegie Mus.*, **12**, 50–52, pl. 34, figures 4 and 5 (1919).

[2] Osborn, H. F., *Bull. Amer. Mus. Nat. Hist.*, **7**, 77–78, figure 2 (1895).

[3] Matthew, W. D., *Ibid.*, **12**, 49 (1899).

[4] Wortman, J., and Matthew, W. D., *Ibid.*, **12**, 114–115, figure 1 (1899).

[5] Matthew, W. D., *Mem. Amer. Mus.*, **9**, pt. 4, 343 (1909).